

Chapter 6: Solving Systems

Solving by Substitution 6.2 Day #3 WS

Period: _____ Date: _____

Solve the following systems by substitution.

- ✓ Remember that it is easiest to solve for variables without a coefficient (i.e. 1 or -1).
- ✓ Substitute (replace) into the other equation, so that only one variable is left.
- ✓ Do not forget to find both values and put your answer in the form of an ordered pair (x, y) .

1. $3x + 2y = 6$
 $x + 3y = 9$

 $(0, 3)$

2. $-2x + y = -9$
 $x - 3y = 2$

 $(5, 1)$

$$\begin{array}{r} -3y \quad -3y \\ x = -3y + 9 \\ 3(-3y + 9) + 2y = 6 \\ -9y + 27 + 2y = 6 \\ -7y + 27 = 6 \\ -27 \quad -27 \\ \hline -7y = -21 \\ -7 \quad -7 \\ \hline y = 3 \end{array}$$

$$\begin{array}{l} x + 3y = 9 \\ x + 3(3) = 9 \\ x + 9 = 9 \\ x = 0 \end{array}$$

$$\begin{array}{r} +3y \quad +3y \\ x = 3y + 2 \\ -2(3y + 2) + y = -9 \\ -6y - 4 + y = -9 \\ -5y - 4 = -9 \\ +4 \quad +4 \\ \hline -5y = -5 \\ -5 \quad -5 \\ \hline y = 1 \end{array}$$

$$\begin{array}{l} x - 3y = 2 \\ x - 3(1) = 2 \\ x - 3 = 2 \\ +3 \quad +3 \\ \hline x = 5 \end{array}$$

3. $y = x + 3$
 $y = 2x$

 $(3, 6)$

4. $3y = 6x - 5$
 $y = 2x - 1$

$$\begin{array}{r} 2x = x + 3 \\ -x \quad -x \\ \hline x = 3 \end{array}$$

$$\begin{array}{l} y = 2x \\ y = 2(3) \\ y = 6 \end{array}$$

$$\begin{array}{r} 3(2x - 1) = 6x - 5 \\ 6x - 3 = 6x - 5 \\ -6x \quad -6x \\ \hline -3 \neq -5 \end{array}$$

FALSE

NO SOLUTION

$$5. \begin{array}{l} y-x=5 \Rightarrow \\ 3y=3x+15 \end{array} \quad \begin{array}{r} y-x=5 \\ +x \quad +x \\ \hline y=x+5 \end{array}$$

$$3(x+5) = 3x+15$$

$$\begin{array}{r} 3x+15 = 3x+15 \\ -3x \quad -3x \\ \hline \end{array}$$

$$15 = 15$$

TRUE

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$$7. \begin{array}{l} y=x+3 \\ y=x-1 \end{array}$$

$$\begin{array}{r} x+3 = x-1 \\ -x \quad -x \\ \hline \end{array}$$

$$3 = -1$$

FALSE

NO
SOLUTION

$$6. \begin{array}{l} -7x-2y=-13 \\ x-2y=11 \end{array}$$

$(3, -4)$

$$\begin{array}{r} +2y \quad +2y \\ \hline x = 2y+11 \end{array}$$

$$-7(2y+11)-2y=-13$$

$$-14y-77-2y=-13$$

$$-16y-77=-13$$

$$\begin{array}{r} +77 \quad +77 \\ \hline \end{array}$$

$$-16y = 64$$

$$\begin{array}{r} -16 \quad -16 \\ \hline \end{array}$$

$$y = -4$$

$$x-2y=11$$

$$x-2(-4)=11$$

$$x+8=11$$

$$\begin{array}{r} -8 \quad -8 \\ \hline \end{array}$$

$$x = 3$$

$$8. \begin{array}{l} y=2x-2 \\ 2y-4x=-4 \end{array}$$

$$2(2x-2)-4x=-4$$

$$4x-4-4x=-4$$

$$0x-4=-4$$

$$-4=-4$$

TRUE

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